ENHANCING EUROPE'S READINESS FOR MANAGING FALL ARMYWORM, AN INVASIVE PEST THREAT

Locations	Bulgaria, France, Greece, Israel, Italy, Netherlands, New Zealand, Portugal, Romania, Spain, Switzerland, United Kingdom
Dates	01/06/2025 - 30/05/2030

Summary

The fall armyworm, *Spodoptera frugiperda*, is one of the major insect invaders in maize production regions worldwide. Over the last decade, this American-origin caterpillar has invaded Africa and Asia, whilst heavily impacting yields. In some countries, food security has been challenged. In other countries, the sudden heavy use of pesticides to control this invasive has created health and environmental problems. The pest has now started to migrate into Europe which is causing concern. Fall armyworm is a new pest to Europe, so the expectation is that pesticides will be used to control it. This collaborative project aims to improve the preparedness of European agricultural actors through safer and more sustainable control practices.

The problem

Over the last 20 years, the fall armyworm, a voracious insect pest, has invaded Africa and Asia. Its caterpillars can feed on a broad spectrum of staple crops, but

they are particularly destructive to maize. As maize is one of the three major carbohydrate providers to humans, this invasive maize pest is becoming a threat to food security on these continents.

Existing pest management includes insecticide applications in maize cultivation. However, over time, as the problem of the pest has worsened, there has been an unprecedented increase in the use of pesticides, causing concerns for human health and the environment.

Unfortunately, since the early 2020s, the pest has started to migrate into Europe, first arriving in southeastern Europe. It is likely that fall armyworm will soon establish in the southern regions of Europe and could become a serious migratory pest for the other maize-producing areas of Europe. It is also expected that Europe will conform to pest management efforts of other countries and use insecticides to control fall armyworm.

Due to the pest being new to Europe, awareness is low, and control strategies and tools are not robust. Therefore, European plant health stakeholders must rapidly improve their preparedness for this pest. Furthermore, the health and environmental hazards posed by pesticides have prompted the call for safer and more sustainable control practices.

What we are doing

This four-year project, called EUFAWREADY (Enhancing Europe's readiness for managing fall armyworm, and invasive pest threat), aims to empower European agricultural actors, such as farmers, advisors, technicians and phytosanitary services to improve their preparedness for fall armyworm outbreaks.

It is led by INRAe of France and has 25 project partners, including CABI (15 academic, three SMEs, four industry partners, two plant health services and one farmer association).

The work is funded by the European Commission's Horizon Europe Research Framework Programme Farm4Fork, under the specific call on "Spotlight on plant priority pest: fall armyworm (Spodoptera frugiperda)."

The project aims to provide advisors and farmers with pest management tools for early detection and effective management of fall armyworm in Europe, minimizing the economic, environmental and social impacts of fall armyworm and the reliance on synthetic pesticides.

The key objectives are to:

- Evaluate stakeholder awareness and preparedness on fall armyworm risks and enhance their engagement in management efforts
- Generate new knowledge on the biology of European fall armyworm populations to determine the traits enhancing their invasion potential
- Evaluate the economic and environmental impacts that the arrival of fall armyworm may induce within Europe
- Provide European stakeholders with efficient strategies for the early detection of fall armyworm
- Leverage natural enemies to broaden the range of effective and sustainable options available to European farmers
- Explore microbial agents to enhance eco-friendly crop protection for European farmers
- Develop novel sustainable solutions for fall armyworm control through exploration of plant-based and natural semiochemicals
- Integrate management solutions into guidelines and toolboxes for European end-users
- Make the project's scientific and technical results accessible to key stakeholders, ensuring they are fully aware of fall armyworm risks and management options

Results so far

So far, potential pest management practices relevant for Europe have been outlined in this publication. Among them, a number of possible nature-based solutions can be developed or adapted for Europe. These include biopesticides based on insecticidal viruses, fungi or bacteria, as well as parasitoids or entomopathogenic nematodes. For example, several parasitoids of the fall armyworm have appeared promising, as outlined in this paper. Furthermore, application techniques could be developed for the application of promising entomopathogenic nematodes on larger-scale maize fields.

The project offers a diverse range of expertise and a mix of stakeholders that have the potential to significantly bring Europe forward in managing this major invader in agriculture.

Funded by the European Union

EUFAWREADY receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No.101212676. Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the EU nor the European Research Executive Agency can be held responsible for them

Donors	European Commission Horizon Europe Research Framework Programme - a spotlight on plant priority pest: fall armyworm (Spodoptera frugiperda)
Partners	INSTITUT NATIONAL DE RECHERCHE POUR L'AGRICULTURE, L'ALIMENTATION ET L'ENVIRONNEMENT), INRAE, France (Coordinator), INRAE TRANSFERT SAS, France, ECOBERTURA FERIMARK 2016 SL, Spain, The Agriculture Research Organization of Israel - Volcani Institute (ARO), Israel, SAPIR ACADEMIC COLLEGE, Israel, Universiteit van Amsterdam (UvA), The Netherlands, Università degli Studi di Brescia (UNIBS), Italy, Universidad de Córdoba (UCO), Spain, Instituto Canario de Investigaciones Agrarias (ICIA), Spain, CABI
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